SYMMETRY AND MOVIE ANIMATION

by Michele Emmer
Dipartimento di Matematica
Università Ca' Foscari, 30123 Venice, Italy
&
A.I.C.S., Italian Association for Scientific Media, President

In the last 15 years I have realized 20 movies and videos in the series "Art and Mathematics". Several cinematographic techniques have been used in the making. In particular in the movie on the works of M.C. Escher and in the film on "Symmetry and Tessellations". Symmetry and crystallographic groups, in Euclidean and non-euclidean space, is an essential part in Escher's art. In one of his book Escher wrote that a succession of symmetric figures with a number of metamorphoses acquires a dynamic character. He suggests that although there is a difference between a series of cinematographic images projected on a screen and the series of figures in the regular division of plane, in both cases the time factor plays a part. In the movie in animation "The Fantastic World of M.C. Escher", thanks to the help of Roger Penrose, H.S.M. Coxeter and Carolyne MacGilllavry (they all appear in the movie), the scientific and mathematics basis of Escher's works are used to introduce movement and to investigate a new aesthetics dimension. A new digitilized video edition of the movie have been realized in 1994. The new movie has a 50 minutes duration. The other movie "Symmetry and Tessellations" include the animation of the Penrose Tilings; the animation was realized before the discovery of quasi-crystals. I propose for the conference to submit a paper on the movie techniques used, a presentation on how the animation were realized and to show the movies in the video version.

References:

M. Emmer, *The Fantastic World of M.C.Escher: Symmetry and Space*, Video DG2 (all standard), 50 m., color, sound, FILM 7 International, Rome, 1994.
M. Emmer, ed., *The Visual Mind: Art and Mathematics*, The MIT Press, Cambridge, 1993; a chapter on symmetry.
H.S.M. Coxeter, M. Emmer, R. Penrose, M. Teuber, eds., *M.C. Escher: Art and Science*, North-Holland, Amsterdam, 1984; a chapter on symmetry.